Henry Skinner

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AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

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The Wings of Bombyx mori (Lepid.: Bombycidae).

By C. W. WOODWORTH, Nanking, China.

The comparison of the wild species of mulberry silkworm, *Bombyx mandarina,* and its domesticated descendant, *Bombyx mori,* is of particular interest as showing the effect which selection and forcing (which have increased the size of the body till the wings are well nigh functionless) may have on the structure of the wing.

The size of the wing of the domesticated silkworm is larger than that of the wild form, but very much less proportionately than the size of the body. The difference in size of either body or wing between the largest and smallest domesticated race is greater than between the latter and the wild species.

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The shape of the front wing of the wild species differs from the domesticated species in the much greater prolongation of the apical portion, making a very much more pronounced excavation in the margin just behind the tip. This, however, is a matter subject to much variation in the domesticated silkworm, the variation being decidedly greater than the difference between the nearest specimens of the two species. The hind wing of the domesticated species is larger in comparison with the front wing than in the wild species and it has lost some of the sharpness of the anal angle, but varies enough to render it impossible to sort the wings with certainty by this character.

In discussing the venation it will be convenient to name the non-terminal elements of the venation by the numerals used in the English system of notation, whereby the cell of the front wing will be bounded, beginning in the rear, by the vein segments bearing the numbers 2, 3, 4, 5, 6, 10, 11, and the stalks beginning near the tip 7, 8, 9. In the hind wing the cell boundary is 2, 3, 4, 5, 6, 8, 9, with the stalk numbered 7.

Segments numbered 2 and 3 of the front wing are more nearly equal and 4 is shorter in the wild species, but in both there is more variation than the difference between the species: so much so that it is probable that with a sufficient series the gap would be bridged. The domesticated species shows greater variation in this particular than the wild species. Numbers 4, 5, 6 are subequal in some specimens of both the wild and domesticated species, but with 4 always the smallest and 6 always the largest. In some wild forms 4 is decidedly the shortest. The greater variation seems to be in the wild species in this respect. Number 10 reduces almost to zero in some specimens of the wild species. It is always the smallest element in the venation of the front wing, but may be larger even in the wild species than shown in Comstock's figure* of the venation of *Bombyx mori*. This segment averages longer in the domesticated species than in the wild form. The stalks 7, 8, 9 may be subequal in both the wild and domesticated species and any may be longer when thus about equal. When

*Manual, p. 202, Wings of Insects, p. 332.

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one is decidedly longer than the others then it is number 7 in the wild species and number 9 in the tame species.

In the hind wing the only differences noticed are the shortness of 4 in the wild species, which often reduces to zero, and the shortness of 7 in the domesticated forms, which may become equal or shorter than 6 though not commonly as short as shown in Comstock's figure. In the wild form it is at least as long and may be nearly or quite twice as long.

The tracheation of the veins can be quite readily followed if the wing is sufficiently decolorized with Labarraque solution. It is not as easy to see as when the tracheae retain air in their lumen, but is equally definite because of the characteristic appearance of the taenidia. The normal tracheation of the front wing is one trachea in vein 1, another branching to serve veins 2 to 4, a third trachea branching for veins 5 to 11, and a fourth trachea in vein 12. In the hind wing both veins 1a and 1c have tracheae, the branching of the third trachea serves veins 2 to 4, the next trachea serves all the remaining veins, but vein 8 has its own trachea also. The presence of two tracheae in the same vein cavity also occurs occasionally in vein 2 of the front wing, both being of about equal size in the basal segment, one going entirely into vein 2, the other branching to also serve veins 3 and 4.

An abnormality was noticed in one specimen of the wild species similar to what is occasionally observed in the domesticated species. This consists of a trachea extending directly across the membrane of the cell and appearing as the basal portion of vein 5. The specimen was clear enough to trace this trachea the whole length, and the abnormality proved to be simply a case where the trachea had become detached during the final molt and swung out of place before the fluid had been withdrawn into the body and the membranes became cemented together. In this case the trachea floated into the cell region at the extreme base and then returned to the vein cavity, abruptly swinging out again and following the fold of the membrane in almost a straight line till nearing the crossvein, when it turned forward to the anterior "vestige," half entering the

crossvein and proceeding partly in and partly out almost to the longitudinal vein. It then took a short cut across the corner of the cell and after entering this vein gave off a branch for vein 11 and then another for the crossvein and continued in a perfectly normal course. The branch into the crossvein also proceeded normally, finally entering vein 5.

One of the most notable features of the wing of the domesticated silkworm is the prominence of the marginal vein. In Comstock's figure this is indicated by the heavy lines used, heavier than any of the veins meeting it. He did not show the broadening of the ends of the veins as they approached this vein. It seems to be an undoubted vein comparable with those found in Diptera. Some wings show it very much more distinctly than others. The wild species shows this same peculiarity, but never in the same degree seen in some examples of the domesticated species, though often more evident than in those tame moths that show it least. The most extreme case I have seen is where the tips of veins 8 and 9 are connected with the margin, with a distinct reticulation as evident as in the tegmina of a grasshopper with two and three cells respectively. As far as I know such cells have not previously been noted in Lepidoptera.

There can be, I think, no doubt as to the ancestral character of *Bombyx mandarina*, though Kellogg* says that it is "not known in wild condition." The caterpillar looks, when feeding, exactly like the darker individuals of the domesticated worm but when at rest flattens itself out against a twig almost as much as a *Catocala* larva. One can sometimes observe a domesticated silkworm doing almost the same thing just after a molt. The prolegs are relatively longer, corresponding with its resting habits. The cocoon is firm and white like the common Chinese white race, but very much smaller.

The changes noted above resulting from domestication are: (1) slightly greater variability, (2) loss of distinctive peculiarities, and (3) a tendency towards extremely primitive conditions of structure.

*American Insects, p. 429.

Odonatological Results of an Auto Trip Across Indiana, Kentucky and Tennessee.

By E. B. WILLIAMSON, Bluffton, Indiana.

(Continued from page 9)

Wednesday morning, July 31, we left Nashville, ate dinner at Murfreesboro, and supper at Manchester. Near Murfreesboro, at road-side wet weather pools we saw a number of *Pantala hymenaea,* and caught a few of them. At a road-side pond about seven miles northwest of Manchester, along the Murfreesboro pike, we collected *Lestes rectangularis, L. vigilax, Pachydiplax longipennis, Libellula incesta, L. luctuosa,* and *Plathemis lydia,* and saw, but did not capture, what we thought was *Epiaeschna heros. Libellula incesta* was numerous and this species and *Lestes vigilax,* which we had hitherto associated with clean glacial lakes, seemed out of place about the shallow muddy pool. In the afternoon a dragonfly was seen patrolling the edge of a woods along the road and, when Cook caught it, it proved to be a fine male of *Somatochlora tenebrosa.*

The Murfreesboro-Manchester pike, a mile or two out of Manchester crosses Duck River, a fine little stream, largely on rock, with ripples and pools, and much vegetation to and overhanging the water. We collected here Thursday forenoon, hoping to find Macromias, but only one, and that doubtfully determined as a *Macromia,* was seen and it was not captured. *Calopteryx maculata* and *Hetaerina americana* were common and one *H. titia* was taken. Other species collected were: *Lestes vigilax, Argia violacea, A. apicalis, A. translata, A. moesta, Enallagma exsulans, Hagenius brevistylus, Dromogomphus spinosus, Pachydiplax longipennis, Libellula incesta, L. pulchella,* and *Plathemis lydia. Argia translata* was the most abundant of the four species of Argias seen.

We left Manchester about 3 P. M. and, passing Wonder Cave, climbed a steep winding road from the lower land and camped that night near Monteagle on the Cumberland highlands. Some small streams crossed during the afternoon contained nothing of interest, though *Calopteryx maculata* was present, literally by hundreds. In the lower country, adjacent

to the bluff which marks the termination of the Cumberland highlands, the soil is largely sandy and there are many oaks in great variety.

We awoke early on August 2 to find our entire equipment soaked with a heavy dew, and airing and drying occupied our time till about 10 A. M. In the bushes near our camp we saw and caught a single teneral male *Libellula auripennis,* thus establishing the occurrence of this species in Tennessee.

We reached Tracy City about 3 P. M. Along the road during the ride from Monteagle we saw many Somatochloras, apparently all one species, and all captured were *tenebrosa.* A mile or two west of Tracy City a long stone bridge crosses a fine little stream, eight to twelve feet wide, with a rocky bed and clear water, the banks steep but seldom broken into cliffs and then only small ones. But the only dragonfly we found there was *Calopteryx maculata.* The vegetation here was entirely different from the deciduous forest through which we had been passing. Laurel and holly, and hemlock and pine were abundant. In a little stream near Tracy City we found a dead female *Epiaeschna heros* floating in the water. No live ones were seen.

On both sides of Tracy City were some small streams similar to a small stream near a saw mill a short distance east of Monteagle, These streams are slow flowing in sandy beds and are overgrown with brush. Adjacent to them are frequent low swampy spots. At one of these streams a female *Somatochlora tenebrosa* was ovipositing in shallow water by dipping the abdomen. Many other Somatochloras were seen here and an Aeschnine, which I think was *Nasiaeschna pentacantha,* flew back and forth at too great a height for our nets. Nearby was a glorious stalk of the orchid, *Blethariglottis ciliaris,* the only one seen. It was preserved and determined by Chas. C. Deam. Just beyond Tracy City, enroute to Jasper, we saw a dragonfly, probably a Corduline, with a dilated abdomen, flying over a field, but it disappeared and a prolonged search in several directions failed to rediscover it. That night we camped near the toll gate about three miles west of Sequatchie.

On the morning of August 3, we left camp about 9 A. M.

and descended from the Cumberland highlands to Sequatchie. About a mile north of Sequatchie, in the lowlands, we collected carefully along a small stream, fifteen to thirty feet wide, with disappointing results, the three Argias, *violacea, translata,* and *moesta, Hagenius brevistylus, Dromogomphus spinosus,* and *Pachydiplax longipennis* only being seen. The country from Sequatchie to the Tennessee River ferry was without interest. The Somatochloras, which we had observed continuously across the Cumberland highlands, disappeared when we left the highlands and descended to Sequatchie. Road side ponds in the lower country as in the highlands were frequented by the common *Plathemis lydia.*

At the Tennessee River ferry numbers of *Macromia taeniolata* were flying and a smaller number of individuals of *Dromogomphus spinosus* were seen. From the ferry to Chattanooga we came around the foot of Lookout Mountain on a wide concrete road with a beautiful view of the city.

August 4 we drove over the Dixie Highway to Rockwood where we ate dinner, having seen nothing of interest odonatologically enroute. Leaving Rockwood for Crossville we immediately climbed by three great loops over a well improved road again into the Cumberland highlands. The view over Rockwood and its environs from this point is superb. From here to Crossville, where we arrived at 4 P. M., *Somatochlora tenebrosa* again put in its appearance, and a number were seen as we drove along. The only other dragonflies seen were *Calopteryx maculata* and *Plathemis lydia.* We left Crossville at once for Jamestown, thirty-six miles to the north. Enroute the country is largely yellow pine. We saw our last *Somatochlora* at 7.30 P. M., arrived at Jamestown about 8 P. M., and put up for the night at the Mark Twain Hotel.

The next day we drove from Jamestown through Forbes, to Monticello, where we arrived about 6 P. M. During the day we crossed several good small streams but we found only Argias and *Calopteryx maculata.* For some reason no Somatochloras were seen but a *Pantala flavescens* was captured patrolling the road. Monticello is a busy little town of about 1600 people. There is no railroad. In fact, after leaving Crossville, we did not see a railroad till we reached Somer-

set, Kentucky. For this reason a brief note on the roads may be of interest. From Chattanooga to Rockwood and from Rockwood to the top of the highlands the road is good. From there to Crossville and from Crossville to Jamestown the road is poor to fair. From Jamestown to Forbes the road is very bad, and from Forbes to Albany bad. From Albany to Monticello the road is very rocky and there are many bad grades, one hill on the bank toward Monticello above the oil station being the steepest hill seen on the trip. From Monticello to Somerset the road is fair with some steep hills.

August 6 we left Monticello on the Burnside Pike for Somerset. At a small muddy roadside pond at the edge of a barnyard and near a house, about seventeen miles out of Monticello, we found a remarkable assemblage of dragonflies. A single *Lestes* was seen and when captured proved to be *eurinus*. *Enallagma aspersum* flew by hundreds or possibly thousands, while *E. civile* was comparatively rare. *Ischnura posita* and *I. verticalis* were both taken. Numbers of *Anax junius* circled the pond with frequent ovipositing females. *Plathemis lydia* was the most conspicuous larger dragonfly present and other Libellulines were *Libellula luctuosa*, *L. pulchella*, *Erythemis simplicicollis*, *Tramea onusta* and *T. lacerata*, the last frequently ovipositing.

After leaving this pond we soon came out on the hill tops overlooking the Cumberland valley, a beautiful and impressive view. We ferried the Cumberland and started to climb the steep grade up from the river. Near the top of this hard pull something went wrong with the Ford and we started to coast backward down the narrow and dangerous road. We rapidly gained speed in our unfortunate predicament and in a moment the Ford turned squarely upside down, fortunately in the road. I jumped and escaped without a scratch but Cook was caught under the machine and was scratched and bruised. Our equipment was badly scrambled but not much damaged. We got aid from Somerset and in a few hours were again on our way. But the collecting, for want of time, was discontinued and we hurried across Kentucky to Cincinnati, Ohio, and thence, through southeastern Indiana, back to Blufftom. So far as I am concerned a wide flung sight-seeing trip and dragonfly collecting are not a successful combination.

Pontedera's 1718 Paper on the Cicada (Homop.).

Introduction by HARRY B. WEISS and Translation by WILLIAM HAMILTON KIRK, Ph.D., New Brunswick, New Jersey.

(Continued from page 16)

I will exhibit in the Tables the instruments of generation, with which the male and female in both classes are equipped. Then I will consider the pregnant female. For although nature has denied her the harmonic drums, yet it has compensated for this by a greater and, so to speak, extraordinary gift, giving her a wise wit and a skill out of proportion to her body. For it has hidden about the middle of the abdomen a sting as long as the fourth part of a thumb, and has hidden this in a sheath hollowed out in a little furrow and extending as far as the genital organ. This sting is rounded, firm, and equipped at the end with saws, and no art has ever invented a fitter instrument for boring; through its interior runs an open channel, the outer mouth of which ends at the saws, while the inner opens into the womb.

As soon as the Cicada has received the genital seed, she begins to look around for a place in which to deposit the already developed eggs. And having found the dry wood of some small tree, drawing her borer, she immediately sets about the work. She bores the wood and hollows out a nest, going down as deep as the length to which the sting projects beyond the belly. Then there is a great exertion in the abdomen and, the muscles pressing on all sides, the eggs are pushed out through the channel into the hole, in form they are round, pointed at both ends, and white. They are laid close, parallel to each other, but obliquely to the diameter of the wood, and in each little hollow 8 or 9 or 10 or more or fewer. Lastly the receptacle is smeared over with a kind of gummy juice, and so is protected against the inclemency of the weather. Having thus finished her first nest, she proceeds to a second, then to a third, to a fourth, until she has got rid of all her eggs. They are very productive of eggs, and have the lowest part of the belly all full of them, and for this reason, in order that they may have a belly more capable of holding so many eggs, nature has not divided them at the

waist, as it has the males. Individuals produce sometimes five hundred, sometimes six hundred eggs and sometimes I have found them to contain seven hundred.

All this which I write here for you in brief, I shall explain more fully in the Tables, adding likenesses of all these parts; for if I have shown that the organ producing the chirping is uncertain and variously explained by naturalists, more uncertain, and for the most part also false do those explanations seem to me which we have of the generation of the Cicadae. For Aristotle (who I see had no slight acquaintance with the history of the Cicada, since his account is more probable than those of the other writers) also mentions the sting, with which he says the Cicadae hollow out a place for their offspring, saying in Bk. V, ch. XXV; "They bring forth in fallow fields, boring with the sharp (point) which they have behind, like the Bruci, which also bring forth in fallows." But what this point, or (as Gaza translates it) roughness sharp at the end, which he describes in the words, "the sharp (point) which they have behind," is I do not know; certainly it is not the sting which I have found, which is placed in the region of the abdomen; this roughness of the Philosopher is placed behind, a word which Pliny, Nat. Hist. Bk. XI, ch. XXVI, copying this passage of Aristotle, explains by *in dorso* "on the back," saying; "A roughness sharp at the end on the back, with which they hollow out in the earth a place for their offspring." Theodore Gaza also in his translation uses about the same Latin words to express Aristotle's meaning; "They bring forth," he says, "in fallows, hollowing out with a roughness sharp at the end, which they have at the hinder part; as the Bruci also bring forth in soil of this kind." For which reason I am easily brought to agree with Julius Scaliger, who explains this point as situated at the buttocks; adding "The Cicadae have at their buttocks a point not unlike the sort of beak that the Gammari have." Further the extremity at the buttocks is longer in females than in males; which is common also to some Bruci. Unless the Philosopher meant this, he wrongly added the phrase "just as the Bruci," for I have never seen or read of, either in the Bruci or in any other insect, an instrument like that of the Cicadae, except

in the Fly *de'Rosai* recently discovered by the illustrious Antonius Vallisnerius, of which Aristotle had no knowledge. But as to the place for the offspring, the Philosopher himself saw that eggs were deposited in the Reeds which are used to prop vines and in the stalks of Squills; for in the same book and chapter he added "They bring forth also in Reeds with which vines are propped, hollowing out the place for the offspring in the Reeds; and in the stalks of Squills." But having in the beginning laid down that the Cicadae bring forth in fallows, he immediately added that eggs of this sort, namely those which they deposit in Reeds and in the stalks of Squills, fall into the earth. Both of which statements are false; for the eggs are not committed to the earth, nor do those which are committed to wood or Reeds (for in these I also have found the eggs of the Cicadae, but very rarely, because usually shrubs which are not empty are chosen) slip into the earth. On the contrary the Cicadae are born in these and remain in them throughout the winter. Add that nature so provided, which so arranged the articulation of the sting of the Cicadae, that not only could they not, going upwards, raise it to hollow out a nest, but could not even bend it horizontally, therefore they are compelled to bore the little hollow for their offspring by directing it downwards. Besides what is the purpose of the gumming? Certainly it keeps the little worm from getting out of the nest by creeping up and going through the open mouth. This is about what the Philosopher says about the generation of the Cicadae. which I will make plain and open by treating it more fully in the Tables. But what is said by other Philosophers is either the same or inferior, as the remarks of Baldus Angelus, Bk. VIII, ch. VII: "I," he says "can testify truly, that in earth not ploughed, or cultivated, looking toward the East, when it is dug up under scattered oaks, immediately Cicadae are dug up, not perfect but of the usual form, and many white, without wings, which were in hiding under the earth. For that reason I do not know whether they all arise from seed, as Aristotle says, or some from decayed matter. I am of the opinion that it is not repugnant to nature that these animals

should arise both spontaneously and from seed, etc." See the acuteness of the man; he had found *tettigometrae* which of necessity have wings not yet unfolded, from this he immediately excogitated very fine reasoning. But, to leave him in his rotten matter; I, rejecting these fables, shall review in the last part of the work first the origin of the Cicadae, then at what time it comes out of the nest, on what nourishment it lives, until it is hidden under the earth, and becomes a *tettigometra;* for neither in the year in which it is born does it turn out a *tettigometra,* nor in that in which it exists as a *tettigometra* does it become a Cicada. Having disposed of which matters, I shall close my book with the Aristotelian problem, "Why Cicadae are not found in places bare of trees and shrubs." I shall show that it is for this reason; first because they are deprived of the supports, on which they are accustomed to sing their marriages, and to celebrate them, then because the females seeking in vain a place proper for depositing their eggs, the race quickly perishes. And this is the meaning of the threat Dionysius of Syracuse once made against the people of Locri in Italy in the words "that for them the Cicadae shall sing on the ground," obscurely hinting that he would not only devastate their land but would so destroy it, that the Cicadae, if they wished to sing, should sing on the ground. For he intended to leave nothing standing out from the earth, not even the Cicadae; since it is not possible for them to survive when the trees are destroyed.

This, most Excellent man, I have to write to you concerning the Cicadae, and also concerning my Tables, and wish that you would as soon as possible in accordance with your friendliness and kindness write me what you think of these points, also let me know whether something should be added or omitted; conceal nothing from me. For the work will be most complete which I publish strengthened by your counsel and authority. Wherefore, whatever your reply may be, I shall follow it; if you say that there must be any addition, it shall be made; I will discard whatever you say is to be discarded; and shall even willingly suppress and delete the whole, if I understand that to be your wish.

A Bee-Collecting Trip Across the Plains (Hym. : Apoidea, Sphecoidea).

By T. D. A. COCKERELL, Boulder, Colorado.

Dr. Frank E. Lutz had spent the summer in Colorado, collecting and observing insects, and was returning home in the American Museum car during the latter half of August. As he had no companion, he kindly invited me to go as far as Lincoln, Nebraska, in order to investigate the bee-fauna along the route. I was glad to accept, as I had never collected far out on the plains, with the exception of a few hours at Sterling years ago. Dr. Lutz himself had demonstrated in former years that the bee-fauna of the eastern part of Colorado was rich in species not observed in the mountains, many of them extending northward from New Mexico or Texas. The visitor who comes out in the summer naturally collects in the higher elevations, with the result that the plains fauna remains comparatively unknown.

According to existing records, Colorado has 697 species of bees, and in addition a considerable series of forms treated as varieties or races. Certainly no other state has so large a list, but California may prove to possess more species than Colorado when it has been thoroughly explored. The Colorado list will be eventually reduced by a certain amount of synonymy, principally resulting from the matching of sexes described as different species. This reduction will, however, probably fail to balance the additions which are even yet being made at frequent intervals. It was a striking demonstration of the imperfection of our knowledge when during the past summer Mr. L. O. Jackson found *Macropis morsei* Rob. in numbers a short distance east of Boulder, adding a family (Ctenoplectridae) to the Colorado fauna.

Dr. Lutz and the writer are collecting data on the Colorado bees, and hope in due course to issue a manual or monograph which will enable the student to determine his species. Few insects are more interesting to collect and study, but at present it is practically impossible for the beginner to determine many of his species. He cannot do it efficiently even if he has access

to a good named collection, because in several genera the characters are likely to be overlooked unless special attention is drawn to them, quite distinct species being superficially almost alike. The genera, on the other hand, are usually to be recognized without much difficulty, although eminent authorities have not infrequently described species in the wrong genus.

We started from Boulder on Aug. 15, and made the first stop near Canfield, in Boulder County, alt. 5,052 feet. Collections were made at the same place from two species of plants.

(1). On *Peritoma serrulatum.—Bombus fervidus* Fab., *Spinoliella australior* Ckll. ♀ (one had no light median stripe on clypeus), *Perdita zebrata* Cress. ♂, ♀, *Tetraloniella excurrens* Ckll. ♀ (genus and species new to Colo.), *Anthophora occidentalis* Cress. ♀

(2) On *Grindelia decumbens.—Nomia bakeri* Ckll. ♀ (abundant), *Melissodes agilis subagilis* Ckll. ♂, *Halictus pectoraloides* Ckll. ♀ (new to Colo.; antennae much darker than usual).

The two additions to the fauna were known from New Mexico.

At noon we were at Wiggins, Morgan County. It was extremely hot and dusty, and the dry season had resulted in the failure of most of the crops from here on to the eastern border of the state. A small collection at Wiggins from *Peritoma serrulatum* consisted of *Megachile brevis* Say, ♀, *Spinoliella australior* Ckll. ♀, and *Perdita zebrata* Cress., ♂, ♀. *

About six miles east of Wiggins we found the small sunflower *Helianthus petiolaris* in quantity. It is not nearly so attractive to bees as the large species, and I was led to wonder whether it might differ from that in being self-fertile. This was also suggested by the failure to find hybrids, although the two readily hybridize when crossed by hand in the garden. Nevertheless, what *H. petiolaris* lacked in the quantity of its visitors, it made up in quality, as we got the following:

Triepeolus cyclurus n. sp., *Andrena pulchella* Rob. ♂ (new to Colo.), *Perdita laticincta* Swenk & Ckll. ♂ (new to Colo.) and *Halictus*

*Mr. S. A. Rohwer has kindly identified two wasps I obtained, and the records are of some interest. *Larropsis conferta* (Fox) ♂. At flowers of *Peritoma serrulatum*, Wiggins, Aug. 15. New to U. S. N. M. *Tachysphex propinquus* Vier. Six miles east of Wiggins, Aug. 15, dragging its prey, which Mr. Caudell identifies as *Phlibostroma quadrimaculatum* var. *pictum* Scudd.

pruinosiformis Crawf. ♀. Viereck has published a new name for *Andrena pulchella*, but according to my understanding of the matter, this is not necessary.

In the evening we put up at the auto camp at Fort Morgan, 4,338 ft., and before sunset I captured males of *Melissodes agilis aurigena* Cress. at *Helianthus annuus lenticularis*. The next day, Aug. 16, we found quantities of *Helianthus petiolaris* about 7½ miles west of Xenia, and collected from the flowers *Andrena haynesi* Vier. & Ckll., ♀ (new to Colo.), *Halictus pruinosiformis* Crawf., ♀, *Panurginus leucopterus* n. sp., *Perdita laticincta* Swenk & Ckll., ♂, and *P. lacteipennis* Swenk & Ckll., ♂. The *Andrena* was described from Nebraska.

Wray, reached at noon, was a disappointment. In a former year Dr. Lutz had collected a very fine and interesting series of bees here, but although there were plenty of flowers, I only got a ♀ *Melissodes confusiformis* Ckll., visiting *Helianthus annuus lenticularis*. The reason was an exceedingly hot dry wind, blowing from the south. The butterfly *Nathalis iole* was seen. We accordingly went on into Nebraska, and near Sanborn, a short distance over the line, Dr. Lutz picked up our first specimen of the so-called Colorado potato beetle, *Leptinotarsa decemlineata*. Later, at Oxford, Nebr., it was found on the traditional food-plant, *Solanum rostratum*. We camped at Benkelman, Nebr., close to the race-course. There were few flowers, but early next morning, while Dr. Lutz was ministering to the machine, I collected successfully as follows:

(1.) On *Helianthus annuus lenticularis.—Bombus americanorum* Fabr., worker (it was seen to go first to prickly lettuce, then to sunflower), *Halictus armaticeps* Cress. ♀, *Panurginus stigmalis* Swenk & Ckll. ♀, ♂ (form with nervures paler than in type), *Perdita albipennis* Cress. ♀, *P. lacteipennis* Swenk & Ckll. ♀.

(2.) On *Peritoma serrulatum.—Halictus politissimus* Ckll. ♀ (new to Nebr., described from Texas), *H. tegularis* Rob. ♀; *H. pruinosus* Rob. ♀, *H. pruinosiformis* Crawf. ♀. It seems probable that the original range of certain plants may be determined by the presence of oligotropic bees. The absence of *Perdita zebrata* on the *Peritoma* at Benkelman suggests that the plant may have spread out of its range as a weed. It was extremely interesting to note that the species of *Halictus* (subg. *Chloralictus*) had completely taken the place of the *Perdita*, climbing the long stamens and collecting the green pollen in

exactly the same manner. The species principally concerned in this, and very abundant, was *H. tegularis* Rob., described from Illinois, but known to extend westward. Possibly the competition of the *Halictus* was the true cause of the absence of *Perdita*.

After traveling over some very bad roads, we camped at Oxford, Nebr., early enough to do some collecting.

Halictus sparsus Rob. (described from Illinois) was taken on *Solanum rostratum*, and the following occurred on *Helianthus annuus lenticularis*: *Agapostemon texanus* Cress. ♂, *Melissodes agilis aurigenia* Cress. ♂, ♀, *Triepeolus helianthi* Rob. ♂, ♀, *Perdita albipennis* Cress, ♂.

The last collecting was done the next day, Aug. 18, at Friend, Nebr., a place which lives up to its name, providing excellent accommodations. The following were all at *Helianthus annuus lenticularis*:

Bombus americanorum Fabr., *Melissodes agilis aurigenia* Cress. ♂, *M. obliqua* Say, ♂ (much worn), *Triepeolus helianthi* Rob. ♂, *T. remigatus* Fabr. ♀, *Megachile parallela* Sm. ♀ (form with hair of head and sides of thorax yellowish). This is an eastern (or Mississippi valley) series of bees, and the character of the fauna was further emphasized by finding on the sunflowers numbers of the green beetle *Diabrotica longicornis* Say, which we do not find in Colorado. We also saw a Baltimore Oriole.

Arriving at Lincoln, I had my first sight of the very rich bee-collection of the University of Nebraska, and was surprised to find that there were still many species in Professor Bruner's Argentine series which I had not studied. Professor Swenk's materials of *Colletes*, including many specimens borrowed from various people and institutions, constitute the largest assemblage of this genus in the country, and it is greatly to be hoped that he will shortly continue his excellent publications on the genus. I was much pleased to meet Mr. R. W. Dawson, and to hear all about his wonderful work on *Serica*. Dr. Lutz hastened on eastward, while I spent the night in the hospitable home of Professor and Mrs. Swenk, returning to Colorado by train the following day.

The results of the trip are not extraordinary, for our day and generation, but the time will come when the story will be read with something of the feeling I had when Dr. Coues described to me the early work in Arizona, when one "shot a new bird before breakfast each morning."

The new species described below are in the writer's collection.

Panurginus leucopterus n. sp.

♂. Length about 5.5 mm., but the abdomen is curved like the letter J; slender, black, with scanty white hair, the face not conspicuously hairy; eyes black; face below level of antennae very pale yellow; supraclypeal mark quadrate, broader than long; lateral face marks ending at right angles to orbits, but presenting a rounded extension or lobe below the antennae; process of labrum and large mark on mandibles yellowish-white; process of labrum with strongly converging concave sides, the apex distinctly emarginate; clypeus with strong punctures, and no median groove; antennae long, entirely black; mesothorax shining, but well punctured; base of metathorax rugulose, with a broad, somewhat lustrous rim; tegulae piceous; wings milky hyaline; stigma large, rather dilute brown, the costa before it white; nervures colorless; basal nervure falling considerably short of nervulus; first recurrent joining second submarginal cell about twice as far from base as second recurrent from apex; legs black with small light spot on knees, anterior tibiae yellow in front, tarsi pale yellow, the last three joints black except anterior pair; abdomen shining, finely punctured, except the usual smooth parts.

About 7½ miles west of Xenia, Colorado, Aug. 16, at flowers of *Heliantkus petiolaris,* 6 ♂. In my key in Amer. Museum Novitates, No. 36, this runs to *P. piercei,* Crawf., which is considerably larger and has dusky wings. By the milky wings it resembles *P. lactipennis* Friese, from Russia. The process of labrum is rather like that of *P. labrosiformis distractus* Ckll., but there is little resemblance otherwise.

Triepeolus cyclurus n. sp.

♀ Length about 10 mm.; black, the pubescent ornaments very pale yellowish, on ventral surface white; labrum, clypeus, antennae (except third joint red on outer side), scutellum and axillae black; mandibles mainly red; legs bright ferruginous, with black spurs; tegulae clear ferruginous; wings with apical margin broadly dusky, stigma and nervures black. Eyes purplish-grey; clypeus dullish, minutely granular; mesothorax with pale border at sides and behind, but not in front; a pair of broad discal stripes, pointed at each end, not quite reaching anterior margin; scutellum bigibbous; axillary spines well-developed; basal area of metathorax tensely hairy; inner side of hind basitarsi with very pale orange hair; pleura with a large space partly free from hair, dull and densely granular; abdominal markings sharply defined; first segment with a black area on each side, shaped like a bird's head, and a very broad transverse black band, subtruncate at each end, its

upper side straight and not interrupted, but the posterior pale band interrupted in middle; segments 2 to 4 with entire bands, that on 2 with a large hook-shaped extension (pointing mesad) on each side above, and at extreme sides an angular lobe; venter with white bands, that on fourth segment interrupted; pygidial area circular, shining; last ventral segment curved downward at end.

Six miles east of Wiggins, Colorado, Aug. 15, at flowers of *Helianthus petiolaris,* 1 ♀. By the curved last ventral segment this resembles the much larger and otherwise different *T. concavus* Cress. and *T. penicilliferus* Brues. In the key in Amer. Mus. Novitates, No. 23, it runs to *T. laticaudus* Ckll., which is not closely allied.

Tetraloniella excurrens (Ckll.).

The female from near Canfield is evidently conspecific with the type from Roswell, New Mexico; in my table in Trans. Am. Ent. Soc., xxxii, it runs nearest to *Melissodes spissa* Cress., but is easily separated by the dark tegulae and other characters. It should be noted that the clypeus is hairy all over, except a narrow line in middle, there is a fulvous tuft at tip of labrum, and the bare posterior part of first abdominal segment is extended anteriorly on each side by a rounded area.

The form *verbesinarum* (Ckll.), which I have treated as a synonym of *excurrens*, may stand as a subspecies, *T. excurrens verbesinarum*. It differs by the narrower bands on the third and fourth abdominal segments, that on the third lacking the basal thinner portion. This is probably not an individual peculiarity. The genus *Xenoglossodes*, to which the species has been referred, is a synonym of *Tetraloniella* Ashmead.

A New Peritropis from the Eastern United States (Heteroptera-Miridae).[1]

By HARRY H. KNIGHT, University of Minnesota, St. Paul.

Peritropis husseyi new species.

Brownish black, dorsum alutaceous and rather closely spotted with pale; basal margin of pronotum broadly sulcate in outline, rounding laterally to the basal angles, devoid of tubercles, practically transverse

[1] Published, with the approval of the Director, as Paper No. 344 of the Journal Series of the Minnesota Agricultural Experiment Station.

on the middle one-third. Thus differing from *saldiformis* in which the basal margin is concavely sinuate, and forming three small marginal tubercles, one at the median line and a larger one at each side.

♀.—Length 3.2 mm. *Head*: width .62 mm., vertex .31 mm., length .57 mm., from front margin of eyes to tip of tylus .31 mm.; front of head more porrect and cone-shaped than in *saldiformis;* brownish black, irregularly marked with small pale spots, three or four larger spots on the strongly flattened tylus, bucculae tinged with reddish. *Rostrum*: length 2.22 mm., nearly attaining the hind margin of the first genital segment, brownish black.

Antennae: segment I, length .28 mm., black; II, 1 mm., nearly cylindrical but slightly thickened toward apex, not attaining the thickness of segment I, black, a small pale spot on dorsal side near middle, the extreme tip slightly pale, clothed with very fine, short pale pubescence; III, .29 mm.; IV, .34 mm.; last two segments slender, black.

Pronotum: length along median line .51 mm., width at base 1.17 mm., anterior angles .61 mm., lateral margins practically straight, slenderly but distinctly reflexed, anterior angles prominent, forming right angles; basal margin broadly sulcate, rounding distally to the basal angles, devoid of marginal tubercles, practically transverse on the middle one-third; calli less prominent and not so abruptly convex as in *saldiformis*, separated by a foveate groove at the median line of disk; brownish black, disk rather closely dotted with pale, spots frequently confluent, slender lower margin of propleura and a line extending distad from dorsal extremity of coxal cleft, pale. *Scutellum* nearly as in *saldiformis*, more broadly pale at apex, a few pale dots adjoining; mesoscutum exposed for a longitudinal space equal to two-thirds the length of scutellum, a curved pale mark near each basal angle. *Sternum* and pleura brownish black, basalar plate, posterior and ventral margins of epimera, pale; ostiolar peritreme pale, ostiole dusky.

Hemelytra: width 1.54 mm., embolar margins arcuate, somewhat reflexed basally; brownish black, rather closely spotted with pale, the spots frequently elongate or confluent, each pale point with a minute, short, scale-like pubescent hair; tip of clavus and spot at inner basal angle of cuneus pale by the fusion of several small points; cuneus blackish, a few pale points near base. *Membrane* uniformly pale fuscous, the veins scarcely darker, slightly paler bordering margin of cuneus.

Legs: uniformly brownish black, coxae scarcely paler at the apices; intermediate and hind tibiae paler apically, a narrow pale annulus near middle; tarsi pale fuscous, hind pair more nearly pale.

Venter: brownish black, pale yellowish pubescent, longest near base of ovipositor.

♂.—Length 3 mm., width 1.4 mm.; slightly smaller than the female but very similar in structure and color; genital claspers prominent and distinctive.

Holotype: ♀ August 11th, 1920, Washtenaw County, Michigan (R. F. Hussey); author's collection. *Allotype*: ♂ June 9th, 1917, Tuskeegee, Alabama (H. H. Knight), collected at light; Cornell University collection. *Paratype*: ♀, taken with the holotype; collection of R. F. Hussey.

Since drawing up the description of the female, the writer discovered a male specimen among some unmounted material, taken near Tuskeegee, Alabama, while collecting on a tent trap-light.

In addition to the structural difference found in the pronotum, *saldiformis* differs from *husseyi* in being more brownish than black, clavus and corium devoid of pale points, coxae white, and the first antennal segment with a white annulus on the basal half. The writer has for study, cotypes of *saldiformis* from the Heidemann collection; a multilated female "Washington, D. C."; nymph, 2 ♀ July 20, and a nymph July 28, 1890. Also a female specimen, April 24, Brownsville, Texas, which does not differ appreciably from the type specimens.

Mr. Hussey sends the following notes on the capture of the new *Peritropis*:

The two specimens taken August 11 were collected about three miles west of Ann Arbor, at the edge of the University Forestry Farm. I had worked around the pine plantations, with moderate luck, and decided to try for some Aradids in the thin oak and hickory woods across the fence. At the very edge of the woods I found a pile of white oak logs, apparently cut for fence-posts, some of them with the bark loosened, others with the bark still tight. I found a lot of Aradid nymphs and one adult, and while I was picking up some of them I saw this Mirid run out from under the bark where it was still untouched. Remembering my experience with *Fulvius imbecilis* (which I suspected this to be, since I had seen it only from the corner of my eye), and the extreme agility of that species, I was a bit too anxious and caught the bug under the edge of the bottle which accounts for the mutilated condition of the specimen. A minute or so afterward I turned up two more, of which I got one; the other escaped while I was busy. I saw no more of them that afternoon, nor was I able to find any on August 15, September 1, and September 3, when I revisited the place. I examined not only this one log-pile, but all the other stacks of wood that I ran across on the University Farm. This *Peritropis* is a moderately active form, but by no means as quick and agile as *Fulvius*.

A New Tachinid Parasite of the Codling Moth (Dip.).

By J. M. ALDRICH, Associate Curator, U. S. National Museum, Washington, D. C.

The new species belongs to the genus *Anachaetopsis*, heretofore known only in two European species. Our American species is so much like *ocypterina* Zett., the genotype (as represented in the National Museum by specimens received from Dr. Villeneuve), that except for a few characters a description may be drawn to cover both. We have, however, only females of the new species.

ANACHAETOPSIS Brauer and Bergenstamm.

Brauer and Bergenstamm, Zweifl. Kais. Mus., IV, 1889, p. 106; VI, 1893, p. 148.—Brauer, Verh. k. k. Z. B. Ges. Wien, 1893, 490.—Baer, Die Tachinen, Berlin, 1921, pp. 82, 146.

With distinct macrochaetae on head, thorax and abdomen; both sexes with orbitals and wide front; antennae long, reaching edge of mouth, third joint more than twice as long as second; arista with penultimate joint variable, sometimes more than twice as long as thick; vibrissae well developed, at oral margin, not approximated; facial ridges bristly almost to the level of the arista, the frontal rows descending nearly as far; parafacials narrow, bare; palpi normal; proboscis small; eyes bare.

Wings of normal shape, veins bare except base of third, apical cell petiolate, the petiole a little less than one-half as long as hind cross-vein; costal segment before tip of first vein less than one-third the following one; costal spine distinct; apical cross-vein more oblique than the hind; third vein ending only a little before the tip.

Chaetotaxy: ocellars normal; verticals 2, the inner large; frontals about 6, the second from above large and reclinate, the lowest almost at the level of the arista; orbitals two in both sexes; vibrissae large, at oral margin; facial ridges with row of bristles almost meeting frontals. (Thorax) Acrostichals 3, 3; dorsocentrals 3, 3, the hindmost large; humerals 3; posthumerals 2-3, including the "anterior intraalar;" notopleurals 2; supraalars 3, the middle large; intraalars 3; postalars 2, one large; scutellum with two large lateral pairs, and sometimes a very minute hairlike pair of apicals, disk with a few tall, straight spines; mesopleura with one large anterior, a row at hind edge, and a partial row beginning just behind the humerus and extending downward; sternopleurals 2, 1; pteropleural 1, smallish; hypopleurals, the usual row. (Abdomen) First segment with one lateral and one median marginal; second segment with one discal, one lateral and one median marginal; third with one discal and a marginal row of four pairs; fourth with a discal row of four pairs and a few smaller marginals.

All the discals are large and erect. (Legs) Front tibiae with one bristle on outer hind side below middle, and a row on front side; middle tibiae with one bristle on outer front side, one inner, and two on outer hind. (Wing) Costal spine distinct; third vein with 2-3 quite large setules at base.

Anachaetopsis vagans new species.

♀. Wholly black in ground color, including palpi; front shining on upper half, then becoming silvery, which extends down the parafacials; third antennal joint about two and one-half times the second; mesonotum and pleurae subshining black with distinct white pruinosity; abdomen shining black, not quite polished, with faint but visible narrow anterior border of white pruinosity on second and third segments. Hind tibia with 10-12 small rather regular bristles on outer hind side.

Length 3.7 to 4.2 mm.

Three females, reared at Medford, Oregon, September 6, 1922, from the Codling Moth, *Carpocapsa pomonella* Linn. (Quaintance No. 9305).

Type.—Female, No. 25798 U. S. Nat. Mus.

The European type species, *ocypterina* Zett., differs only in having the abdomen highly polished, without any pruinose bands; and in having on the outer side of the hind tibia a row of only about six irregular bristles, some of which are quite large; the third antennal joint appears to be slightly longer, In the male of *ocypterina* (and presumably in the unknown males of *vagans*), the third antennal joint is five times as long as the second.

Ocypterina has been reared from Pterophorid moths in Europe (Baer). No particulars regarding the reproductive physiology have been made known; one female shows a blunt point in the terminal abdominal segment, about as in *Phorocera claripennis,* from which macrotype eggs might be surmised.

In regard to the relationships of the genus, the type species was described as *Tachina* (Zetterstedt, Dipt. Scand., iii, 1844, 1077); but the author in his analysis of the species, p. 1007, indicated that it would go in *Degeeria* Mg. Brauer and Bergenstamm place it next to *Phorichaeta* Rond., which, however, has a row of bristles down the parafacials. Townsend has placed the specimens in the National Museum next to *Chaetophleps polita* Coq., which he makes the type of *Euchaetophleps* new genus; but this species is a synonym of *Hypostena nitens* Coq., which Townsend makes type of the new genus *Oxynops,* in an entirely different tribe some distance away. This species *nitens,* under whatever genus, seems to be the nearest American relative; it has the apical cell narrowly open.

There is a second European species, *morio* Fall., which has yellow palpi, facial ridges less bristly, and apical cell open or barely closed.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., FEBRUARY, 1923.

Entomology at the Convocation Week Meetings, December, 1922.

The meetings of the American Association for the Advancement of Science and of the Associated Scientific Societies were held December 26 to 30, 1922, nominally in Boston, Massachusetts, but for the most part actually in Cambridge, which is a separate municipality with its own mayor. All of the sessions concerning entomology, as well as most other biological sciences, found place in the magnificent new (1916) buildings of the Massachusetts Institute of Technology, on the Cambridge side of the Charles River (Back Bay) at Massachusetts Avenue. The great extent of these structures made it possible to pass from the meeting of one society to another without going out of doors, a very comfortable condition during the snow storm, which lasted all day on December 28 and for a part of the 29th. It was necessary, to be sure, to go out to nearby Walker Memorial Hall, where tasty luncheons were served on the cafeteria plan, but no complaint can justly be made of this arrangement. We are grateful for all the conveniences and dispositions which made the whole series of meetings very agreeable and profitable.

Papers relating, in whole or in part, to the tracheate Arthropods were listed on the programs of

American Association for the Advancement of Science, general sessions	1
The same, Section E, Geology and Geography	1
American Society of Zoologists (alone)	10
The same with the Ecological Society of America	1
The same with the Botanical Society of America (joint Genetics section)	7
The same with the Ecological Society and the American Society of Naturalists	2
Entomological Society of America (alone)	40
American Association of Economic Entomologists (alone, but including its sections on Apiculture and Horticultural Inspection)	76
The same with the American Phytopathological Society	2
Ecological Society of America (alone)	6
American Nature Study Society	1
Society of American Foresters with Section K (Social and Economic Sciences), A. A. A. S., and New England Forestry Congress	2
A. A. A. S., Section N, Medical Sciences	2
Total	151

These 151 papers were concerned with the following subjects:

General Entomology 11
Methods 1
Cytology 1
Anatomy 8
Physiology 9
Ontogeny 5
Genetics 7
Geographical Distribution 8
Taxonomy 4
Ecology 28
Evolution 2
Parasites of Animals 4
Relations to Man 3
General Economic Entomology 12
Insects injurious to Plants 25
Insecticides and Fumigants 15
Apiculture 8
Other Special Insects 1

Onychophora 1
Araneina 1
Acarina 2
Insects (more than one Order) 9
Orthoptera 2
Isoptera 2
Plecoptera 1
Ephemerida 2
Odonata 2
Neuroptera 1
Homoptera 13
Heteroptera 5
Coleoptera 12
Hymenoptera (exclusive of *Apis*) 5
Apis 5
Trichoptera 2
Lepidoptera 14
Diptera (exclusive of *Drosophila*) 14
Drosophila 3

Many of the figures in this second list are duplicated; thus a paper on the Genetics of *Drosophila* appears under both of these headings.

Among the more pretentious events were:

The First William Thompson Sedgwick Memorial Lecture by Prof. Edmund B. Wilson, of Columbia University, on *The Physical Basis of Life.*

The annual address of the Entomological Society of America by Prof. W. M. Wheeler on *The Physiognomy of Insects,* dealing largely, but not exclusively, with the shapes of the heads of ants, as conditioned chiefly by the size and position of the flexor muscles of the mandibles.

The annual presidential address to the American Association of Economic Entomologists by Prof. J. G. Sanders, Director of the Bureau of Plant Industry, Pennsylvania Dept. of Agriculture, on *Whither is Entomology?*

The symposia of the Entomological Society of America on *Adaptations of Insects to Special Environments* (21 speakers); of the Economic Entomologists on *Standards for the Training of Men who are to enter Professional Entomology* (7 speakers), and with the American Phytopathological Society on *Plant Quarantines* (5 speakers, 2 of them for entomology); of the Zoologists, Ecologists and Naturalists on *Geographical Distribution* (9 speakers, 1 of them on Insects, 1 on Onychophora).

The dinner of the American Nature Study Society in honor of Mrs. Anna Botsford Comstock, who is retiring as Professor of Nature Study at Cornell University, on December 28.

The annual dinner of the Entomologists on December 29.

The total of 151 papers is almost exactly the same as that recorded (152) in the NEWS for February, 1922 (pages 53-55), as having been listed on the corresponding programs at Toronto, in December, 1921.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

Paradichlorobenzene as a Fumigant in the Entomological Museum.

During the past year the writer has made tests with paradichlorobenzine to determine its value as a fumigant and deterrent of insect pests in the entomological museum. This material was introduced into boxes and drawers which were infested with the confused flour beetle (*Tribolium confusum*). It was found that the beetles were killed in from one to six hours, the time depending upon the amount of crystals introduced. Tests were also made on the effectiveness of paradichlorobenzine in killing dermestid larvae which commonly infest neglected museum drawers. A few crystals of this chemical, when placed in a tight drawer, were found to kill dermestid larvae in from one to four hours. This chemical not only acts as a deterrent of pests which would enter insect cases, but will actually kill those that cannot retreat within a limited time. Paradichlorobenzene, which is now readily obtained in the market, comes in crystalline form and can be handled much as napthalene, but when used in the insect cabinet has the advantage of killing the pests which are confined in the cases. Paradichlorobenzene evaporates somewhat more rapidly than napthalene, still a half ounce placed in a tight case will last from five to eight weeks, and the gas may still be effective for three or four months in unopened cases. This material is the most convenient and satisfactory fumigant for insect cases that the writer has used, in fact, proving so successful that carbon disulphide fumigation has been discontinued in the care of the insect collections at the University of Minnesota.—HARRY H. KNIGHT, University of Minnesota.

A New Character for Differentiating the Families of Muscoidea (Dipt.).

Every beginner in the study of the Muscoidea has found it difficult to distinguish with certainty what family some forms belong to and there has long been much uncertainty as to the validity of the distinction between the Dexiidae and the Sarcophagidae. Two or three years ago I had occasion to make an exhaustive examination of the Tachinidae and related forms to discover if there were present some hitherto unconsidered character which would enable any entomologist to recognize the different families with more certainty than is at present possible. After some careful comparative work I finally decided that it is invariably possible to distinguish between the Sarcophagidae, Muscidae, and Calliphoridae on one hand, and the Tachinidae and Dexiidae

on the other by the shape of the metanotum. In the last two this is biconvex in profile, there being a small but distinct convexity just below the scutellum which is absent in the members of the other three families known to me.

This character is so constant that it must have a fundamental significance and it is remarkable that in the group which we in this country consider as the Tachinidae practically all the species which are inquilines or parasites in the nests of bees, such as the genera *Metopia*, *Senotania*, etc., lack the basal convexity and are definitely allied in this respect with Sarcophagidae. I consider, however, that they are entitled to separate family rank, being more readily separable from Sarcophagidae than are the Muscidae from the Anthomyiidae. Some European workers have lumped these genera with the Sarcophagidae.

I make this character known at this time to enable other workers to try it out as fully as possible.—J. R. MALLOCH, Biological Survey, Washington, D. C.

Let Us Try to Help Each Other (Dip.: Borboridae).

In the Tijdschrift voor Entomologie, lxiv, p. 120, Dr. Duda (I suppose we all know his, the learned doctor's, individual name) has a paper entitled "Fiebrigella und Archiborborus, zwei neue sudamerikanische Borboridengattungen," in which two new genera of the dipterous family Borboridae are proposed. In spite of the numerous published articles and recommendations on the publication of scientific papers, and the recommendations of the International Committee on Nomenclature, as to the designation of types, we have here an instance of either indifference, ignorance or carelessness in the preparation of the paper. It is regrettable that this is true of so many valuable contributions.

Archiborborus is proposed for *Borborus hirtipes* Macq. and the following new species: *submaculatus* (Chile), *maculipennis* (Chile), *setosus* (Bolivia), *calceatus* (Colombia), *orbitalis* (Peru and Bolivia) and var. *latifrons* (Peru). No mention of a genotype or even type specimens for the species (this latter a common omission of authors). There should have been a genotype designated for *Archiborborus*, but apparently there is none. I therefore designate *Archiborborus submaculatus* Duda the type of *Archiborborus*.

For the habitat of *Fiebrigella verrucosa* n. g., n. sp., one must refer to the general discussion of the genera in the beginning of the paper. None is given in the proper place under the description of the genus and species. This is very tantalizing.

A table of the genera of the Borboridae is included in the paper, which will no doubt prove useful to students of that family.—E. T. CRESSON, JR.

A Remarkable Butterfly (Lep.: Papilionidae).

As far as is certainly known at present, the *Ornithoptera* group of Papilios is unrepresented in Africa, but from reports that reach England from time to time it is thought that this group may be represented or that a third species of giant Papilios exists, similar to the ***antimachus*** and ***zalmoxis,*** or even perhaps a hybrid between the two. There is, for instance, an authenticated report of such an insect having been seen in Liberia which rather bears out my own experience when crossing the higher Lindi River in the Stanleyville district of the Belgian Congo. I was on my way to Stanleyville from a place named Irumu, near Lake Albert, and having arrived at the Lindi River, which at this point is a good two hundred yards wide, I was crossing it in a canoe when from the opposite bank came flying towards me a large insect of the *antimachus* type but of heavier build and flight. It circled over the water and round and above the canoe, where I got a good look at it. The hind wings appeared to me to be a rich brown, spotted and barred with black at the edges, the fore wings having each a broad transverse bar across them of a vivid blue-green on a ground color of black. The insect eventually flew away over the trees, and although I waited there for the rest of the day it never returned. Some five or six miles farther on, and in the forest, I thought I saw a similar insect, but I could not be sure that this was not a *zalmoxis.*

I put down this record for what it is worth, as the insect may subsequently be captured by some lucky individual. I have of course been asked why I did not stay a week or a month on the spot and attempt to capture so great a prize; the answer is that at that time (not long after the signing of the Treaty of Peace) passages to England were exceedingly difficult to obtain, and having booked and paid for two berths (for myself and my wife) on a homeward bound steamer six months in advance, I was unable to give the time necessary for the purpose without losing our passages. As a matter of fact, I reached my port of embarkation with only two days to spare.

T. ALEXANDER BARNS.

Mr. Barns is once again in Africa in quest of this rare insect, but at the time of writing no specimens have been seen. Confirmation of the existence of this butterfly has been supplied by my friend, Monsieur F. Le Cerf, of the Paris Museum.

A certain Sergeant Monceaux (now Captain), when employed on the Franco-Liberian Boundary Commission for the delimitation of the frontier between Liberia and French Guinea, made a collection of over 4,000 Lepidoptera which he brought to the Paris Museum. He stated as having seen in the region of the Upper Sasandra River a large butterfly drinking at a pool of water on the road. It closed and opened its wings alternately, and the observer was able to get fairly close to

it before it flew away. The sergeant stated that the wings of this butterfly were very long and for the greater part of a brilliant blue color.

Monsieur Le Cerf showed Sergeant Monceaux several species in the museum, including *P. zalmoxis,* but he recognized none of them as being the insect he had seen. The sergeant pulled out some other drawers and seeing *P. antimachus,* exclaimed: "C'est comme cette espèce là, mais avec beaucoup de bleu brilliant et encore plus grand." (It is like that species there, but with a lot of bright blue and still larger.)

This butterfly has been observed also on two occasions in Nigeria.

—G. TALBOT.

(Copied from "Wonderland of the Eastern Congo," pages 253-254 and 267; author, T. Alexander Barns, F. R. G. S., F. Z. S., F. E. S. G. P. Putnam's Sons, London and New York.)

Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

The titles occurring in the Entomological News are not listed.

4—Canadian Entomologist, Guelph, Canada. **9**—The Entomologist, London. **24**—Annales de la Societe Entomologique de France, Paris. **52**—Zoologischer Anzeiger, Leipsic. **68**—Science, Garrison on the Hudson, N. Y. **69**—Comptes Rendus des seances de l'Academie des Sciences, Paris. **70**—Journal of Morphology, Philadelphia. **72**—The Annals of Applied Biology, London. **76**—Nature, London. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **111**—Archiv fur Naturgeschichte, Berlin.

GENERAL. Bedel, Louis—Notice necrologique sur. . . **24,** xci, 165-89. **Gillett, F.**—Light trap experiments in connection with temperatures, etc. **9,** lv, 274-7. **Index generales**—Annuaire general des universites . . . Publie sous la direction de R. de Montessus de Ballore. Paris, 1921, 1845 pp. **Parshley, H. M.**—On the formation of family names like Tingidae. **68,** lvi, 754-5.

ANATOMY, PHYSIOLOGY, ETC. Bowen, R. H.—Studies on insect spermatogenesis. **70,** xxxvii, 79-194. Notes on the occurrence of abnormal mitoses in spermatogenesis. **100,** xliii, 184-202. **Brocher, F.**—Etude experimentale sur le fonctionnement du vaisseau dorsal et sur le circulation du sang chez les insectes. V. **24,** xci, 156-64. **Bugnion, E.**—Les organes lumineux du ver luisant provencal (Phausis delarouzeei). (Festschr. fur Zschokke. N. 33. Basel). **Crozier, W. J.**—"Reversal of inhibition" by atropine in caterpillars. **100,** xliii, 239-45. **Desoil et Delhaye**—Essais d'infestation experimentale du tube digestif par oeufs et larves de Calliphora vomitoria. **69,** lxxxvii, 1303-5. **Mallock, A.**—Divided composite eyes. **76,** cx, 770-1. **Metz, C. W.**—Chromosome studies on the Diptera. IV. Incomplete synapsis of chromosomes in Dasyllis grossa. **100,** xliii, 253-66. Association of homologous chromosomes in tetraploid cells of Diptera. **100,** xliii, 369-73.

ARACHNIDA AND MYRIOPODA. Gudger, E. W.—Spiders as fishermen. (Nat. Hist., New York, xxii, 565-8).

ORTHOPTERA. Giglio-Tos, E.—Genera insectorum. Fasc. 177. Mantidae, subf. Eremiaphilinae.

HEMIPTERA. Altson, A. M.—On the young larvae of Lyctus brunneus. **72,** ix, 187-96. **Barber & Weiss**—The lace bugs of New Jersey. (Circ. 54, New Jersey Dept. Agr. Bur. Sta. & Insp.). **Schmidt, E.**—Beitrage zur kenntnis aussereuropaischer zikaden. (Homoptera). **111,** 1922, A, 11, 262-6.

LEPIDOPTERA. Meyrick, E.—Exotic microlepidoptera. Vol. II, p. 545-608. [many Neotropical species described.]. **Mousley, H.**—Further notes on the Rhopalocera of Hatley, Stanstead Co., Quebec, 1921-22. (Can Field-Nat., xxxvi, 141-2.) **Seitz, A.**—The Macrolepidoptera of the World. Fauna indoaustralica. No. 118. Fauna americana. Part. 111-12.

Benjamin, F. H.—Notes on Exyra semicrocea and form hubbardiana. **4,** liv, 220-1. **McDunnough, J.**—Some apparently undescribed Noctuidae. **4,** liv, 236-8.

DIPTERA. Feuerborn, H. J.—Das hypopygium "inversum" und "circumversum" der dipteren. **52,** lv, 189-212. **Smith, K. M.**—A study of the life-history of the onion fly (Hylemyia antiqua). **72,** ix, 177-83. **Surcouf, J.**—Genera insectorum. Fasc. 175. Tabanidae. **Wesenberg-Lund, C.**—The pupal stage of the mosquitoes. (Festsch. z. Feier d. 60 Geburts von Zschokke, Basel, 1921, N. 23).

McDunnough, J.—Two new Canadian Tabanidae. **4,** liv, 238-40.

COLEOPTERA. Boppe, P.—Genera insectorum Fac. 178. Cerambycidae, subf. Disteniinae-Lepturinae. **Chatanay, J.**—Genera

insectorum. Fasc. **176.** Tenebrionidae, subf. Zophosinae. **Chittenden, F. H.**—The cocklebur billbug. **4,** liv, 217-20. **Fenyes, A.**—Genera insectorum. Fasc. 173c, Staphylinidae, subf. Aleocharinae, p. 415-53. **Roberts, A. W. R.**—On the life history of "wireworms" of the genus Agriotes, with some notes on that of Athous haemorrhoidalis. **72,** ix, 306-24.

HYMENOPTERA. Emery, C.—Genera insectorum. Fac. 174b. Formicidae, subf. Myrmicinae, p. 95-206. **Garlick, W. G.**—Concerning the feeding habits of the purslane sawfly larva. **4,** liv, 240. **Mayor, A. G.**—The tracking instinct in a tortugas ant. (Carnegie Inst. Wash., Pub. No. 312, p. 103-7.).

Doings of Societies.

Entomological Society of America.

The seventeenth annual meeting of the Entomological Society of America was held in Cambridge, Massachusetts, in the Buildings of the Massachusetts Institute of Technology, on December 26, 27 and 29, 1922. The meetings were unusually well attended, the attendance ranging from about 75 to 250 in the different sessions.

Seventy-four new members were elected during the past year, bringing the total membership to 652, the largest in the history of the society.

Professor T. D. A. Cockerell, of the University of Colorado, was elected president; William S. Marshall, of the University of Wisconsin, was chosen first vice-president; F. E. Lutz, American Museum of Natural History, New York, second vice-president, and C. L. Metcalf, University of Illinois, secretary-treasurer.

Other elections were: Managing Editor of Annals, Prof. Herbert Osborn, Ohio State University; additional members of Executive Committee, Arthur Gibson, Dominion Entomologist, Ottawa, Canada; Dr. William A. Riley, University of Minnesota; Prof. R. A. Cooley, Agr. Experiment Station, Bozeman, Montana; Charles W. Johnson, Boston Society of Natural History; Dr. E. P. Felt, State Entomologist, Albany, New York, and Prof. A. L. Melander, State College, Pullman, Washington.

The Society voted to raise the annual dues from $2.00 to $3.00, effective January 1, 1924.

Professor J. J. Davis, of Purdue University, was appointed Treasurer of the Thomas Say Foundation, to succeed Dr. E. D. Ball, resigned.

Messrs. R. A. Cooley, R. W. Harned and Guy C. Crampton were elected as new members of the Editorial Board of the Annals.

The Society approved the constitution for the Union of American Biological Societies, as published in *Science* for September 29, 1922, and appointed A. N. Caudell and A. G. Böving as the representatives

of the Society to attend such meetings as may be called in Washington during the coming year.

The following subject was selected for the Symposium at the Cincinnati meeting in 1923: "Methods of Protection and Defense Among Insects."

C. L. METCALF, *Secretary.*

The American Entomological Society.

Meeting of April 27, 1922, in the hall of the Academy of Natural Sciences of Philadelphia. Eight persons present, Dr. Henry Skinner presiding.

Mr. Cresson, of the Property Committee, reported the following additions to the Cabinet: 7 named Hymenoptera from Hawaiian Islands, from Dr. D. M. Castle; 2 paratypes from Michigan, of *Enocherus liljebladi* Wal. (Coleop.) from A. B. Wolcott; 81 Hymenoptera, 96 Diptera, U. S., Dr. Victor A. Loeb; 41 Coleoptera (Tenebrionidae) from U. S., from Dr. F. E. Blaisdell.

Dr. Arthur D. Whedon, 525 South High Street, West Chester, Pa., and Mr. John C. Holinger, Girard Trust Co., Phila., were elected to membership in the Society.

HYMENOPTERA.—Dr. Bradley, of Cornell University, exhibited a new first American species of the genus *Incomathis* (Hymenoptera), there being four other species known.

LEPIDOPTERA.—Mr. Williams exhibited some slides and drawings of the male genitalia of the larger Hesperidae and made some remarks on the characters disclosed.

Dr. Skinner remarked on the "Corona," as he designated the curious chitinous and membraneous appendages found in some species of Hesperidae at the apex of the aedoeagus.

DERMAPTERA.—The combined exotic collection of Dermaptera was exhibited by Messrs. Rehn and Hebard. Two hundred and forty-four species are now included, representing ninety genera. In the collection are also the types of twenty-four species. Burr's treatment of the Order in the *Genera Insectorum* was shown, which included one hundred and forty-six genera, the number of subsequently described genera brings the total up to approximately one hundred and sixty. The growth of this portion of the collection has in recent years been very rapid and it was pointed out that the Dermaptera are among the most difficult Orders of insects to secure quantity. The North American collection of Dermaptera is now complete, containing material of every species found north of the Mexican border.

Dr. Skinner spoke of Dr. Malcolm Burr, the Dermapterist, and of a visit to his home and collections, followed by a further tribute to Dr. Burr and his work by Mr. Rehn and Mr. Hebard.

R. C. WILLIAMS, *Recording Secretary.*

OBITUARY.

HENRY JOHN ELWES, F. R. S., F. E. S., was born in 1846 and died at his home, Colesborne Hall, Cheltenham, England, November 26th, 1922, after a long illness.[1] He was educated at Eton and subsequently joined the Scots Guards, in which he became Captain. His activities were big game hunting, horticulture, agriculture, systematic botany and entomology. He traveled extensively and covered a large part of the world and made collections in the Himalayas, Andes and the mountains of Japan and China, as well as in the Rocky Mountains and other parts of North America. It botany he was favorably known by his monograph on the lilies and his great work on *The Trees of Great Britain and Ireland*. He was an authority on the Palaearctic Rhopalocera and published many interesting and valuable papers on these butterflies. The papers on *Parnassius* and *Erebia* are well known, also an annotated list of the Rhopalocera of Sikkim.

He was elected a member of the Royal Society in 1897 and President of the Entomological Society of London for the years 1893 and 1894. In 1897 he was elected a Corresponding Member of The American Entomological Society.

As stated above, Mr. Elwes collected in this country and took a great interest in its butterfly fauna. His revision of the genus *Argynnis*[2] included the species found in North America and the same is true of his paper on the genus *Erebia*,[3] in which he described a high altitude form of *epipsodea* under the name *brucei*. Another interesting paper is *On a Collection of Lepidoptera from Arctic America*.[4] With this is a color plate of rare species, including *Colias boothi* Curtis and *Erebia fasciata* Butler. A large part of his valuable collection was presented to the British Museum and the remainder was purchased by Mr. J. J. Joicey.

HENRY SKINNER.

[1]Entomologists Record, 1922, xxxiv. By G. T. Bethune-Baker.
[2]Trans. Ent. Soc. Lond., 1889, p. 535.
[3]Trans. Ent. Soc. Lond., 1889, p. 317.
[4]Trans. Ent. Soc. Lond., 1903, p. 239, pl. ix.

The December, 1922, issue of ENTOMOLOGICAL NEWS was mailed at the Philadelphia Post Office, December 11, 1922.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Buprestidae, Cleridae, and **Carabinae** wanted from U. S. or Buprestidae of the world. Will collect insects of any group (except Lepidoptera) in exchange or pay cash. Alan S. Nicolay, 416a Grand Ave., Brooklyn, New York.

For Exchange—A large number of live cocoons of Callosamia promethea, C. cynthia and P. cecropia for other pupae or Lepidoptera. D. C. Heim, Sunbury, Pa.

Wanted to Exchange—N. A. Coleoptera for same not in my collection. Carl Selinger, 4419 Dover St., Chicago, Ill.

Wanted for Cash or Exchange—Catocala eggs, also brilliant colored butterflies and moths for trays. Mrs. Robert Milde, Lewiston, Minn.

Syrphidae from all parts of North America wanted. Monographing the family.—C. H. Curran, Department of Entomology, University of Kansas, Lawrence, Kansas.

Will collect in all orders except Lepidoptera, in exchange for Cerambycidae (longicorn beetles) and Pentatomidae (stink-bugs). G. Chagnon, P. O. Box 521, Montreal, Canada.

I will collect Coleoptera and Lepidoptera in southwest Arkansas for those so interested.—Miss Louise Knobel, 417 West 2nd Avenue, Hope, Arkansas.

Correspondence solicited from anyone desiring general collections of insects, to be made in Costa Rica. Austin Smith, Apartado 412, San José, Costa Rica.

Wanted—For cash, during winter of 1922 and 1923, pupae of Saturniid moths. Please state species, quantity and price. P. Rau, 2819 S. Kingshighway, St. Louis.

Wanted—Am working on a Revision of the Buprestidae of the West Indies and would like to examine any material in this family from that region. W. S. Fisher, U. S. National Museum, Washington, D. C.

For Exchange—A large number of Papilio Turnus, P. Cresphontes and P. Ajax pupae, or the same specimens in papers, for other pupae or Lepidoptera. Carl Selinger, 4419 Dover St., Chicago, Ill.

Wanted—Dytiscidae not in my collection, in exchange for local specimens. Offer Coelambus sellatus, Oregonus, etc. F. S. Carr, 11050 123rd St., Edmonton, Alberta.

Coleoptera for exchange—Cicin. generosa, hirticollis, modesta, sexguttata, 12-punctata, Saperda populnea, Uro. fasciata, Donacia subtilis, palmata, texana-minor, biimpressa, refuscens. Ernest Baylis, 5011 Saul St., Philadelphia, Pa.

Endomychidae. I desire to purchase representatives of this family from any part of the world. Particularly desire specimens from the western and southwestern part of the U. S. L. B. Walton, Kenyon College, Gambier, Ohio.

RECENT LITERATURE

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GENERAL.

832.—**Crampton** (G. C.).—The genitalia of male Diptera and Mecoptera compared with those of related insects, from the standpoint of phylogeny. (Trans., **48**, 207-225, 3 pls., 1923) ..... .50

DIPTERA.

833.—**Malloch** (J. R.).—Flies of the anthomyiid genus Phaonia and related genera, known to occur in N. A. (Trans., **48**, 227-282, 3 pls., 1923)..... 1.25

HYMENOPTERA.

830.—**Cresson** (E. T., Jr.).—The Bassett types of Cynipidae. (Trans., **48**, 197-203, 1923)..... .15

LEPIDOPTERA.

831.—**Bell** (E. L.).—A new species of Hesperiidae. (Trans., **48**, 205-206, 1923) ..... .10

ORTHOPTERA.

829.—**Hebard** (M.).—Dermaptera and Orthoptera from the state of Sinaloa, Mexico, Pt. I. Dermaptera and non-saltatorial Orthoptera. (Trans., **48**, 157-196, 2 pls., 1923) ..... .85

Of Interest to Specialists.

The American Entomological Society has placed in operation a system by which entomologists who are not situated near the larger reference libraries, or who desire to build up special entomological libraries of their own and yet do not care to subscribe to the annual volume of the Society's "Transactions," may secure copies of the papers appearing in the Society's publications promptly after their receipt from the press.

If you are interested and desire to avail yourself of this system, advise us of the order or orders in which you wish to secure publications, together with a remittance of $1.00 or more as a deposit, and all papers on such orders will be mailed to you directly on their receipt from the printer. These will be charged against your amount of deposit at 25 per cent. discount from the list or general sale price. Any balance to your credit is returnable on demand should you not care to continue the subscription.

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